

**WHAT IS CLAIMED IS:**

1. An intermittent aberrant component activity tracking method comprising:  
continuously monitoring a component;  
sensing a characteristic of the component;  
performing real time statistical calculations using sensed values of the  
characteristic of the component; and  
storing, in a memory, data including results of the calculations indicative of a  
fault.
2. The method of claim 1 further comprising providing for retrieval of the data.
3. The method of claim 1 further comprising uploading the data to a main  
controller at regular intervals.
4. The method of claim 1 wherein the component is an encoder.
5. The method of claim 4 wherein the sensed characteristic of the encoder is its  
timing.
6. The method of claim 4 wherein servo specifications of the encoder require a  
tolerance of  $\pm 0.1\%$  to  $\pm 5\%$ .
7. The method of claim 1 wherein the component is a sensor.
8. The method of claim 1 further comprising using a serial control bus to retrieve  
the data in real time.
9. The method of claim 1 wherein each data point is put into a range bucket.

10. The method of claim 9 further including incrementing an event count at a respective location when a data point falls into a range bucket.

11. The method of claim 9 wherein the data are represented by a counter rather than a real encoder value.

12. The method of claim 1 wherein the main controller analyzes the data as necessary.

13. The method of claim 1 wherein only data values outside of normal run limits would be recorded and studied

14. An aberrant machine component events history providing method comprising:  
communicating data about machine operation to service personnel; and  
alerting service personnel, when a threshold of events is reached, that a failure is imminent.

15. The method of claim 14 further comprising allowing access to the data to determine if further repairs are needed.

16. The method of claim 15 wherein the data can be accessed remotely.

17. The method of claim 14 wherein the component is a motor encoder.

18. The method of claim 14 wherein the component is a sensor.

19. The method of claim 14 wherein the component is a power supply and the data reflect voltage readings.

20. The method of claim 14 wherein the component is responsible for timing functions.

21. The method of claim 14 wherein the component produces and the system records pulse width modulation (PWM) values.

22. A fault detection apparatus comprising:  
means for continuously monitoring a component characteristic;  
means for performing real time statistical calculations; and  
means for storing, in a memory, results of the calculations indicative of a fault.

23. The apparatus of claim 22 further comprising means for allowing retrieval of the results by service personnel.

24. The apparatus of claim 22 further comprising means for uploading the results to a main controller at regular intervals during a run process.

25. A real time encoder frequency excursion recording method that can record excursions in real time on a PWBA in an operating environment, the method comprising:  
continuously monitoring the encoder timing;  
doing real time statistical calculations; and  
storing the results of the calculations indicative of a fault in a memory for  
retrieval by service personnel or for uploading to the main controller at  
regular intervals during the run process.

26. The method of claim 25 wherein servo specifications require a tolerance of  $\pm 0.1\%$  to  $\pm 5\%$ .

27. The method of claim 25 wherein only results values outside of normal run limits would be recorded and studied.

28. The method of claim 25 further comprising using a serial control bus to retrieve the data in real time.

29. The method of claim 25 wherein each data point is put into a range bucket.

30. The method of claim 29 further including incrementing an event count at a respective location when a data point falls into a range bucket.

31. The method of claim 29 wherein the data are represented by a counter rather than a real encoder value.

32. The method of claim 25 wherein the main controller analyzes the data as necessary.